Amendment to the Claims

This listing of claims will replace all prior versions and listings of claims in the above-referenced application. In accordance with 37 C.F.R. 1.121, as revised June 30, 2003, claims are labeled as "Original", "Currently amended", "Canceled", "Withdrawn", "Previously presented", "New", or "Not entered".

1. (Currently amended) A method of synthesizing nucleic acid molecules comprising steps of:

a) providing at least one nucleic acid template;

b) providing a collection of nucleotides sufficient to synthesize a nucleic acid strand complementary to at least a portion of the nucleic acid template, the collection including ~~nucleotide precursors that include~~ at least one pair of complementary nucleotide analog precursors that have a reduced ability to form a stable intramolecular hydrogen bonded base pairs ~~with each other~~, wherein each member of said pair can form a stable hydrogen bonded base pair with its complementary naturally occurring nucleotide; and

c) contacting the template and collection of nucleotides ~~nucleotide precursors~~ with an enzyme characterized by an ability to polymerize the precursors under conditions and for a time sufficient to synthesize the complementary ~~for synthesis of the~~ nucleic acid strand ~~molecule~~.

2. (Previously presented) The method of claim 1, wherein in the step of providing a template, the template is RNA, messenger RNA, DNA, genomic DNA, plasmid DNA or DNA reverse transcribed from RNA.

3. (Currently amended) The method of claim 1, wherein in the step of providing the collection of nucleotides ~~nucleotide precursors~~, the nucleotide precursors include ~~contain~~ A' and T' wherein A' and T' have a reduced ability to form a stable hydrogen-bonded base pair, wherein A' can form a stable base pair with T* and wherein T' can form a stable base pair with A*.

4. (Original) The method of claim 3, wherein A' is 2-aminoadenosine triphosphate, T' is 2-thiothymidine triphosphate, A* is adenine and T* is thymidine.

5. (Currently amended) The method of claim 1, wherein in the step of providing the collection of nucleotides ~~nucleotide precursors~~, the nucleotide precursors include ~~contain~~ G' and C' wherein G' and C' have a reduced ability to form a stable hydrogen-bonded base pair, wherein G' can form a stable base pair with C*, and wherein C' can form a stable base pair with G*.

6. (Original) The method of claim 5, wherein G' is inosine triphosphate, C' is pyrrolo-pyrimidine triphosphate, G* is guanosine and C* is cytidine.

7. (Original) The method of claim 5, wherein G' is guanosine triphosphate, C' is 2-thioC triphosphate, G* is inosine triphosphate and C* is cytidine triphosphate.

8. (Currently amended) The method of claim 1, wherein in the step of providing the collection of nucleotides ~~nucleotide precursors~~, the nucleotide precursors are selected from the group consisting of: 2-aminodeoxyadenosine 5'-triphosphate, 2-thiodeoxythymidine 5'-triphosphate, deoxyinosine 5'-triphosphate, deoxypyrrolopyrimidine 5'-triphosphate, 2-thiodeoxycytidine 5'-triphosphate, deoxyguanosine 5'-triphosphate, deoxycytidine 5'-triphosphate, deoxyadenosine 5'-triphosphate, deoxythymidine 5'-triphosphate, and combinations thereof.

9. (Previously presented) The method of claim 1, wherein in the step of contacting, the enzyme is selected from the group consisting of: RNA polymerase, DNA polymerase, reverse transcriptase, ribozyme, and self-replicating RNA molecule.

10. (Currently amended) The method of claim 1, wherein the nucleic acid molecules ~~with reduced levels of cross hybridization~~ are used in a ligase assay, a polymerase extension assay, or a nucleic acid array assay.

11. (Currently amended) The method of claim 1, wherein the step of providing the collection of nucleotides ~~nucleotide precursors~~ comprises providing at least one nucleotide precursor having a purine analog and at least one nucleotide precursor having a pyrimidine analog wherein the purine analog and the pyrimidine analog are not capable of forming a stable hydrogen bonded base pair, and wherein at least one of the purine or pyrimidine analogs is capable of forming a stable hydrogen bonded base pair with another complementary analog or complementary natural base.

12. (Currently amended) A method of producing nucleic acid molecules comprising steps of:

a) providing a first nucleic acid template having a first sequence element;

b) providing a second nucleic acid template having a second sequence element, wherein the second sequence element is substantially complementary to the first sequence element;

c) providing a collection of nucleotides sufficient to synthesize a first nucleic acid strand complementary to at least a portion of said first nucleic acid template, which portion includes at least said first sequence element, and a second nucleic acid strand complementary to at least a portion of said second nucleic acid template, which portion includes at least said second sequence element, the collection including ~~nucleotide precursors that include~~ pairs of complementary nucleotide analog precursors that have a reduced ability to form a stable intramolecular hydrogen bonded base pairs ~~with each other~~, wherein each member of said pair can form a stable hydrogen bonded base pair with its complementary naturally occurring nucleotide;

d) contacting the first template and collection of nucleotides ~~nucleotide precursors~~ with an enzyme characterized by an ability to polymerize the nucleotide precursors under conditions and for a time sufficient to synthesize the ~~for synthesis of the~~ first complementary nucleic acid strand ~~molecule~~; and

e) contacting the second template and collection of nucleotides ~~nucleotide precursors~~ with an enzyme characterized by an ability to polymerize the nucleotide precursors under conditions and for a time sufficient to synthesize the ~~for synthesis of the~~ second complementary nucleic acid strand ~~molecule~~, wherein at least one of the nucleic acid

strands ~~molecules~~ synthesized is characterized by an ability to hybridize to a third nucleic acid molecule.

13. (Currently amended) The method of claim 12, wherein the step of contacting the first template and collection of nucleotides ~~nucleotide precursors~~ and the step of contacting the second template and collection of nucleotides ~~nucleotide precursors~~ are performed simultaneously in one reaction.

14. (Previously presented) The method of claim 12, wherein in the step of providing a first template and wherein the step of providing a second template, the templates are selected from the group consisting of: RNA, messenger RNA, DNA, genomic DNA, plasmid DNA or DNA reverse transcribed from RNA.

15. (Currently amended) The method of claim 12, wherein in the step of providing the collection of nucleotides ~~nucleotide precursors~~, the nucleotide precursors include ~~contain~~ A' and T' wherein A' and T' have a reduced ability to form a stable hydrogen-bonded base pair with each other, wherein A' can form a stable base pair with T* and wherein T' can form a stable base pair with A*.

16. (Original) The method of claim 15, wherein A' is 2-aminoadenosine triphosphate, T' is 2-thiothymidine triphosphate, A* is adenosine and T* is thymidine.

17. (Currently amended) The method of claim 12, wherein in the step of providing the collection of nucleotides ~~nucleotide precursors~~, the nucleotide precursors include ~~contain~~ G' and C' wherein G' and C' have a reduced ability to form a stable hydrogen-bonded base pair, wherein G' can form a stable base pair with C*, and wherein C' can form a stable base pair with G*.

18. (Original) The method of claim 17, wherein G' is inosine triphosphate, C' is pyrrolo-pyrimidine triphosphate, G* is guanosine and C* is cytidine.

19. (Original) The method of claim 17, wherein G' is guanosine triphosphate, C' is 2-thioC triphosphate, G* is inosine and C* is cytidine.

20. (Currently amended) The method of claim 12, wherein in the step of providing the collection of nucleotides ~~nucleotide precursors~~, the nucleotide precursors are selected from the group consisting of: 2-aminodeoxyadenosine 5'-triphosphate, 2-thiodeoxythymidine 5'-triphosphate, deoxyinosine 5'-triphosphate, deoxypyrrolopyrimidine 5'-triphosphate, 2-thiodeoxycytidine 5'-triphosphate, deoxyguanosine 5'-triphosphate, deoxycytidine 5'-triphosphate, deoxyadenosine 5'-triphosphate, deoxythymidine 5'-triphosphate, and combinations thereof.

21. (Previously presented) The method of claim 12, wherein in the step of contacting, the enzyme is selected from the group consisting of: RNA polymerase, DNA polymerase, reverse transcriptase, ribozyme, and self-replicating RNA molecule.

22. (Original) The method of claim 12, wherein the nucleic acid molecules are used in a ligase assay, a polymerase extension assay, or a nucleic acid array assay.

23. (Currently amended) The method of claim 12, wherein the step of providing the collection of nucleotides ~~nucleotide precursors~~ comprises providing at least one nucleotide precursor having a purine analog and at least one nucleotide precursor having a pyrimidine analog wherein said purine analog and said pyrimidine analog are not capable of forming a stable hydrogen bonded base pair, and wherein at least one of the purine or pyrimidine analogs is capable of forming a stable hydrogen bonded base pair with another complementary analog or complementary natural base.

24. (Currently amended) A kit comprising nucleotide precursors that include pairs of complementary nucleotide analog precursors that have a reduced ability to form stable hydrogen bonded base pairs with each other, wherein each member of said pair can form a stable hydrogen bonded base pair with its complementary naturally occurring nucleotide; and

at least one enzyme capable of polymerizing the nucleotide precursors into a polynucleotide molecule.

25. (Currently amended) The kit of claim 24 comprising an enzyme capable of polymerizing nucleotide precursors into a polynucleotide molecule, buffer solutions, and nucleotide precursors selected from the group consisting of: 2-aminodeoxyadenosine 5'-triphosphate, 2-thiodeoxythymidine 5'-triphosphate, deoxyinosine 5'-triphosphate, deoxypyrrolopyrimidine 5'-triphosphate, 2-thiodeoxycytidine 5'-triphosphate, deoxyguanosine 5'-triphosphate, deoxycytidine 5'-triphosphate, deoxyadenosine 5'-triphosphate, deoxythymidine 5'-triphosphate.

26. (Original) The kit of claim 24, wherein the enzyme is selected from the group consisting of: RNA polymerase, DNA polymerase, reverse transcriptase, ribozyme, and self-replicating RNA molecule.